

1084342

PATENT SPECIFICATION

DRAWINGS ATTACHED

1084342



Date of Application and filing Complete Specification: June 11, 1966.

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Index at acceptance:—F2 N(6A, 6B4B, 6B5, 6B6B1, 6B7B, 6C)

Int. Cl.:—F 16 I

COMPLETE SPECIFICATION

Improvements in or relating to Soot Blowers

I, PETER MCLELLAND WILSON, a British subject, of Livingstone Street, Clydebank, Dunbartonshire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statements:

This invention relates to use in removing soot or the heat-exchange surface like, and particularly relates to the type comprising an a wheeled carriage mount for longitudinal reciprocatingly mounted on the connected at its rear end to to traverse with the carriage a jet or jets of pressurised at its leading end, and at its rear end on the support within and sealingly associated tube so as to maintain a fluid medium to the lance tube while it rotates relatively to the feed tube the lance tube is rotatable so as to provide for a helical

The chief object of the invention is to provide an improved support for the carriage and tubes.

According to the present invention, in a soot blower of the aforesaid kind the elongated support comprises a beam of box section including a pair of side walls having intumed flanges at their upper edges, and a top wall engaging the top faces of the upper flanges and having at its edges downturned flanges engaging the exterior faces of the side walls.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:—

Figs. 1 and 2 are sectional top plan views of respectively the rear and front end portions of a soot blower;

Fig. 3 is a transverse sectional view on the line III—III of Fig. 1; and

[Price 4s. 6d.]

Fig. 4 is a longitudinal sectional view on the line IV—IV of Fig. 1.

Referring to the drawings:—

A long-stroke retractable soot blower which uses pressurised steam or air as the blowing medium includes:—

ERRATUM

SPECIFICATION No. 1,084,342

Page 1, line 1, for "PETER MCLELLAND WILSON," read "PETER MCCLELLAND WILSON,"

THE PATENT OFFICE
25th March 1968

bearing assembly 7 includes a group of four large, heavy-duty balls 7A nested in small-ball bluster bearings enclosed in casings 52 carried by a plate 53 which is rockable fore and aft about transverse pins 54. The assembly gives practically frictionless support to the lance tube 4 under high-temperature conditions. The carriage 8 includes a rotary tubular drive shaft 14 connected at its front end to the lance tube 4 by the coupling 9 and carrying at its rear end a packing gland 15 whereof the packing lies in the annular space between the feed tube and the shaft and so in effect seals the end of the lance tube while permitting rotary and reciprocating movements of the shaft relative to the feed tube. The carriage 8 is reciprocated by a pair of endless chains 16 connected thereto and passing around pairs

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This invention relates to soot blowers for use in removing soot or other deposits from the heat-exchange surfaces of boilers or the like, and particularly relates to a soot blower of the type comprising an elongated support, a wheeled carriage mounted on the support for longitudinal reciprocation, a lance tube reciprocally mounted on the support and connected at its rear end to the carriage so as to traverse with the carriage while discharging a jet or jets of pressurised blowing medium at its leading end, and a feed tube mounted at its rear end on the support and extending within and sealingly associated with the lance tube so as to maintain a flow of blowing medium to the lance tube while the latter reciprocates relatively to the feed tube. Preferably the lance tube is rotatable during reciprocation so as to provide for a helical jet path.

The chief object of the present invention is to provide an improved elongated support for the carriage and tubes.

According to the present invention, in a soot blower of the aforesaid kind the elongated support comprises a beam of box section including a pair of side walls having intumed flanges at their upper edges, and a top wall engaging the top faces of the upper flanges and having at its edges downturned flanges engaging the exterior faces of the side walls.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:—

Figs. 1 and 2 are sectional top plan views of respectively the rear and front end portions of a soot blower;

Fig. 3 is a transverse sectional view on the line III—III of Fig. 1; and

[Price 4s. 6d.]

Fig. 4 is a longitudinal sectional view on the line IV—IV of Fig. 1.

Referring to the drawings:—

A long-stroke retractable soot blower which uses pressurised steam or air as the blowing medium includes an elongated box-section beam 1 with end flanges 2 and 3, a lance tube 4 extending within the beam 1 and having at its leading end a plurality of radially-directed nozzles as at 5, a feed tube 6 for blowing medium extending within the lance tube, a front bearing assembly 7 connected to the flange 3 and supporting the lance tube 4, a wheeled carriage 8 reciprocable within the beam 1, a coupling 9 detachably connecting the rear end of the lance tube 4 to the carriage 8, an end plate 10 connected to the flange 2 to close the rear end of the beam, a coupling 11 detachably connecting the rear end of the feed tube 6 to the end plate 10, a valve 12 on the end plate 10 operable to control the flow of blowing medium to the feed tube 6, and an auxiliary wheeled carriage 13 reciprocable within the beam to support the feed tube 6, being latched to the main carriage 8 and unlatched on reaching a mid position in the beam during the forward traverse. The bearing assembly 7 includes a group of four large, heavy-duty balls 7A nested in small-ball bluster bearings enclosed in casings 52 carried by a plate 53 which is rockable fore and aft about transverse pins 54. The assembly gives practically frictionless support to the lance tube 4 under high-temperature conditions. The carriage 8 includes a rotary tubular drive shaft 14 connected at its front end to the lance tube 4 by the coupling 9 and carrying at its rear end a packing gland 15 whereof the packing lies in the annular space between the feed tube and the shaft and so in effect seals the end of the lance tube while permitting rotary and reciprocating movements of the shaft relative to the feed tube. The carriage 8 is reciprocated by a pair of endless chains 16 connected thereto and passing around pairs

of end sprockets whereof the leading pair 17 are driven by a traversing unit 18 mounted on the beam 1 at one side thereof and including an electric motor 19 and worm reduction gearing 20. The drive shaft 14 is rotated through worm gearing (not shown) on the carriage 13 and chain-and-sprocket gearing 21 extending through the beam and having its leading sprocket driven by a rotating unit 22 including an electric motor 23 and worm reduction gearing 24. The nozzle end of the lance tube 4 projects a short distance into the boiler to be cleaned through a sleeve 25 penetrating an opening in the boiler wall and secured to the boiler wall by a flange 26 having a pair of lugs 27 to which the bearing assembly 7 is pivotally connected by pins 28. The rear end of the beam 1 is suspended by rods (not shown) connected to slotted flanges 29 on the top wall of the beam (Figs. 3 and 4).

The beam 1 is fabricated of a pair of side walls 30 with inturned top and bottom pairs of flanges 31 and 32, and a top wall 33 engaging the exterior of the top flanges 31 and having downturned side flanges 34 engaging the exterior of the side walls 30, the flanges being secured to the walls by a spot-welding procedure. A pair of channel-section rails for the carriage wheels are secured within the beam by spot-welding the channel bases to the side walls 30. Thus, a beam-and-rails unit is quickly and easily fabricated. The flanged wheels 36 of the carriage 8 and the roller wheels 37 of the auxiliary carriage 13 are disposed within the channels of the rails 35, out-turned flanges 38 on the channel walls co-operating with the wheel flanges to guide the carriage 8. A longitudinal series of doors 39 removably abut the exterior of the bottom flanges 32. The doors are clamped to the flanges by a longitudinal series of cross pieces 40 which are engaged by nuts 41 on studs 42 projecting from the flanges 32, and are guided by end flanges 40A engaging the exterior of the side walls 30, the cross pieces abutting downturned longitudinal edges 39A on the doors. The coupling 9 detachably connecting the lance tube 4 to the carriage shaft 14 consists of a pair of abutting flanges 43 and 44 on the lance tube and shaft respectively, and a peripheral series of removable bolts 45 interconnecting the flanges. The coupling 11 detachably connecting the feed tube 6 to the end plate 10 consists of a step 46 in a through opening 47 in the plate 10 giving entry to the feed tube whereof the end abuts the step, a two-part ring 48 in an annular groove in the feed tube, and a collar 49 which has a bore step 50 engaging the ring 48 and is detachably secured to the plate 10 by a series of bolts 51.

The soot blower operates in orthodox manner. That is, the air or steam jets issue from the nozzles, and the combined traversing and rotational movement of the lance tube effects

movement of the jets in spiral paths within the boiler to blow the soot or other deposits from the heat-exchanging surfaces.

The tubes, carriages, rails and chain-and-sprocket drives are all neatly enclosed in the robust, easily fabricated box-section beam which protects them from damage and the weather. Moreover, the lance tube when due for replacement is readily removed, with the feed tube, through the bottom of the beam without interfering with the beam. The removal is effected by first removing the doors; disconnecting the coupling 9 by unscrewing the bolts 45; disconnecting the coupling 11 by unfastening the collar 49 and removing the ring parts 48; and sliding the rear end of the feed tube forwards through the drive shaft 14 to separate the feed tube from the carriage.

WHAT I CLAIM IS:—

1. A soot blower of the aforesaid kind, wherein the elongated support comprises a beam of box section including a pair of side walls having inturned flanges at their upper edges, and a top wall engaging the top faces of the upper flanges and having at its edges downturned flanges engaging the exterior faces of the side walls.

2. A soot blower according to claim 1, including internal rails engageable by the carriage wheels and consisting of channel members with the channel bases engaging the side walls of the beam and with the carriage wheels disposed between the channel walls.

3. A soot blower according to claim 2, wherein the carriage wheels are flanged and the sides of the rail channels have out-turned flanges co-operating with the wheel flanges to guide the carriage.

4. A soot blower according to claim 1 or 2 or 3, wherein the beam flanges and the channel bases are welded to the adjacent beam walls.

5. A soot blower according to any one of claims 1 to 4, wherein the beam side walls have inturned flanges at their lower edges, and door means are removably clamped to the exterior faces of the lower flanges.

6. A soot blower according to any one of the preceding claims, including an end wall covering the rear end of the beam, a coupling detachably connecting the rear end of the feed tube with the end wall, an aperture in the end wall for through flow of blowing medium into the feed tube, a coupling detachably connecting the rear end of the lance tube with the carriage, and an opening at the bottom of the beam giving access to the beam interior, the arrangement being such that the lance tube is withdrawable with the feed tube downwards through the door means on being detached from the carriage and on detachment of the feed tube from the end wall and carriage.

7. A soot blower according to claim 6, wherein the feed tube extends through a gland sealing the rear end of the lance tube, and

- the feed tube coupling consists of a step in the bore of the end wall aperture engaged by the end face of the feed tube, a split ring removably disposed in a peripheral groove in the exterior of the feed tube, and a collar engaging the ring and screwed to the end wall to clamp the feed tube against the step, so that on disconnecting the collar and removing the split ring the end of the feed tube is capable of sliding through the gland to a position clear of the carriage and enabling removal of the lance tube.
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8. A soot blower according to any one of the preceding claims, wherein a bearing assembly for the lance tube is mounted on the front end of the beam and comprises a group of balls nested in cluster bearings on a plate rockable fore-and-aft about a transverse axis.
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9. A soot blower substantially as hereinbefore described with reference to the accompanying drawings.
- 20

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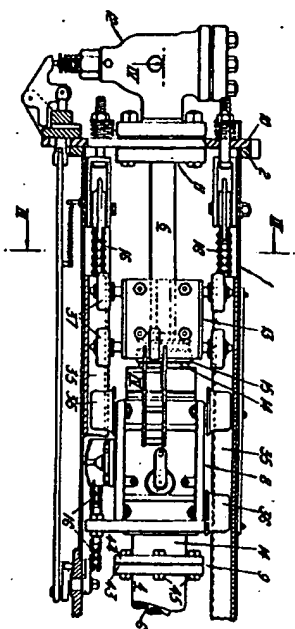


Fig. 1

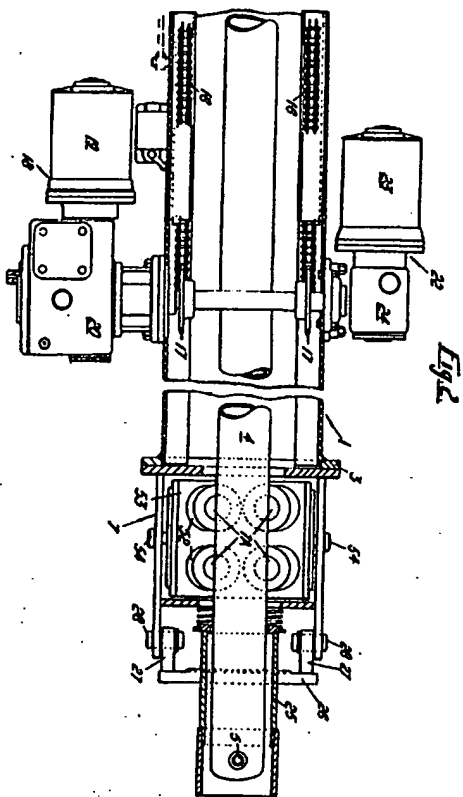
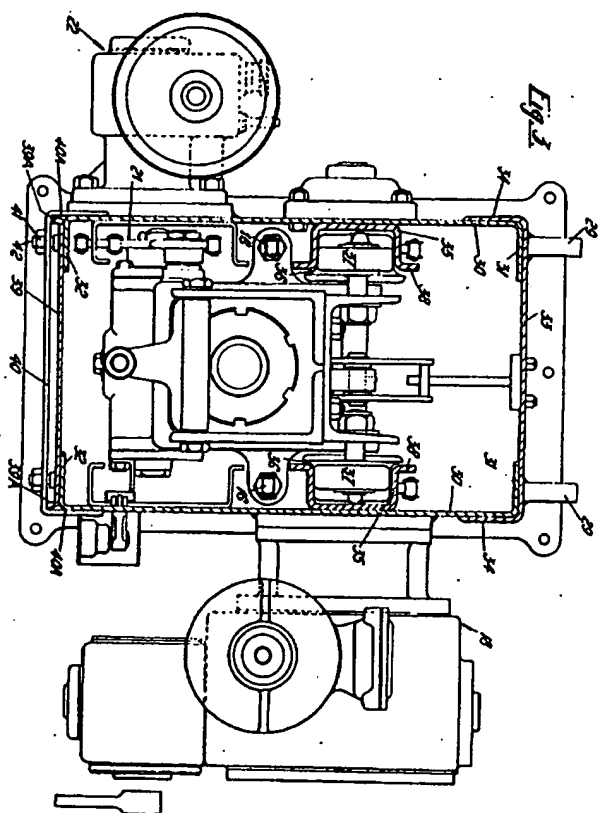


Fig. 2

1084342 COMPLETE SPECIFICATION
3 SHEETS
This drawing is a reproduction of
the Original on a reduced scale
Sheet 1



1084342 COMPLETE SPECIFICATION
 3 SHEETS This drawing is a reproduction of
 the Original on a reduced scale
 Sheet 2

Fig. 4

